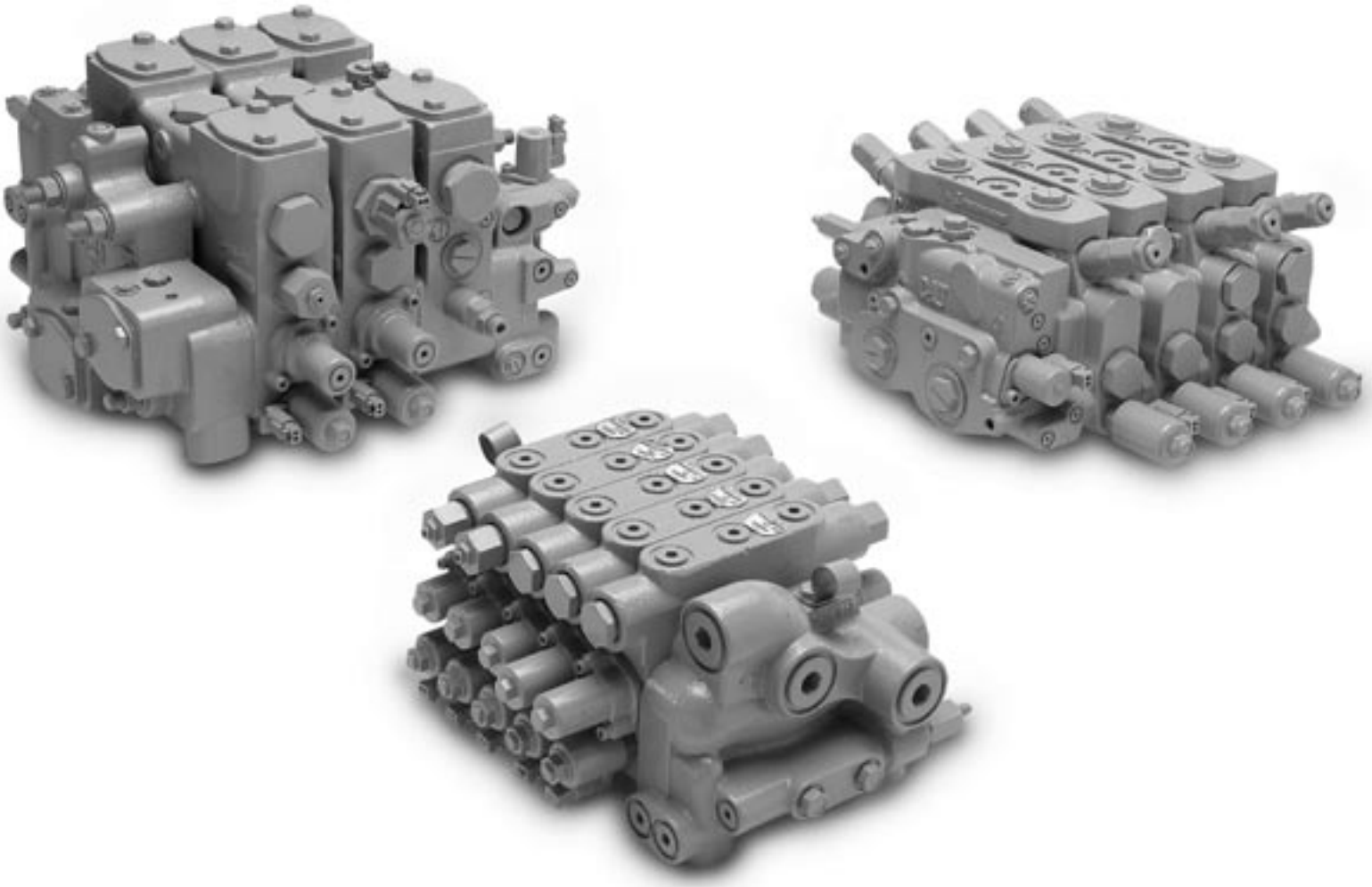
3PC Directional Control Valves



CATERPILLAR®

Count on the hydraulics expert



Caterpillar has been designing hydraulic components and systems for more than 50 years. Our rugged, dependable components make progress possible around the world. Now we're offering our hydraulics expertise to you.

One of the reasons for our long-term success is that we believe a component is only as effective as the system within which it operates. That means we consider the overall function of the system before we design any single part of it. It's an approach that helps us ensure durability and performance throughout the life of a machine.

It's also an approach that promotes flexible solutions to a variety of application challenges at the component level.

Cat® 3PC Valves are a great example. Depending on their configuration, priority can be assigned to one function over another. Their sectional design allows valves to be configured with two to nine sections. This offers great versatility, giving you the ability to specify a valve that perfectly matches the demands of your application.

System functions, like ride control, anti-drift, and pilot supply, can be incorporated into the valve allowing you to reduce hydraulic lines in the system. Integration reduces the need for add-on valves while improving response.

Cat 3PC Valves

- Closed-center and load-sensing features improve fuel efficiency
- Available integrated ride control
- Priority control of functions is offered
- Proportional flow is shared among sections
- Five spool configurations are available
- Internal anti-drift valves and pilot supply eliminate external lines
- Inlet manifold options support fixed and load-sensing pumps
- Low hysteresis and high repeatability provide dependable performance
- Multiple port types and sizes offer greater design flexibility
- Relief valves are available for work ports, main or margin
- Hydraulic and electro-hydraulic actuation available







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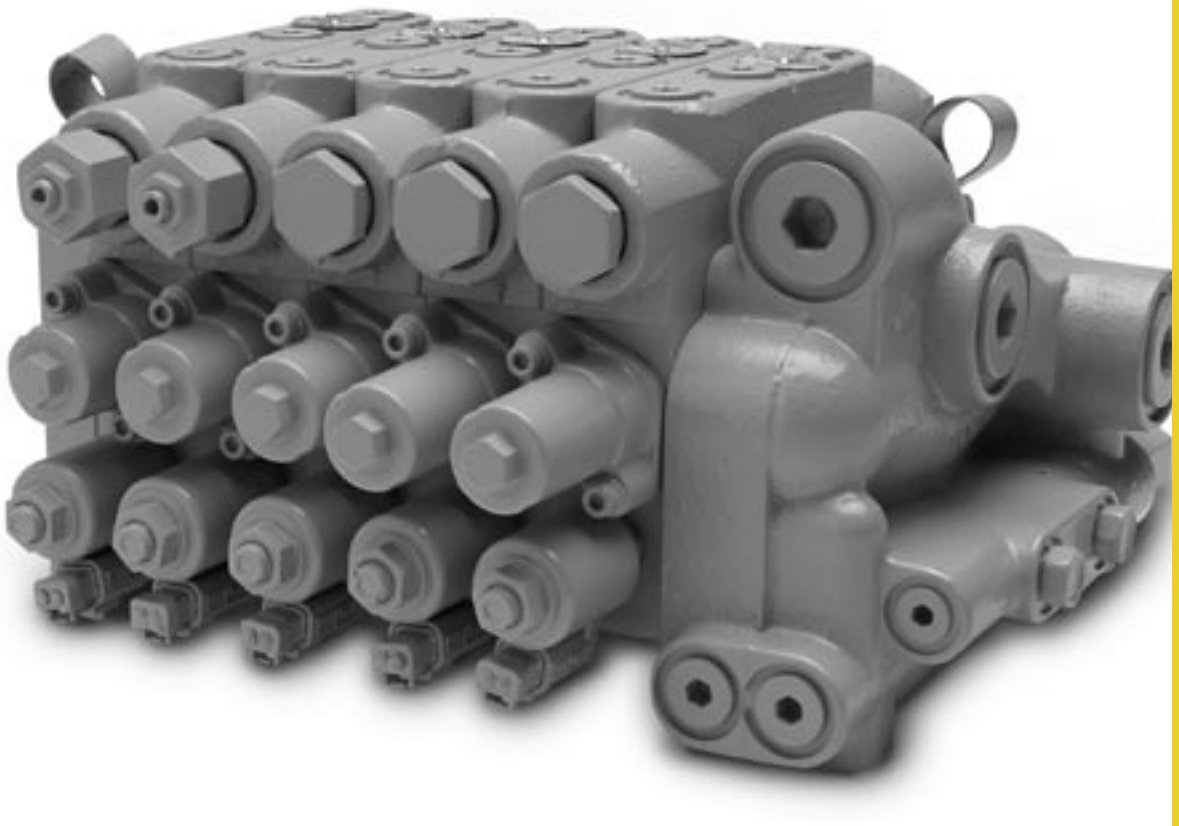
Ordering details 28-30

3PC general specifications/options

General Information	C3PC	S3PC	M3PC
Maximum Flow LPM (GPM)	Pump Port: 135 (35) Work Port: 120 (32)	Pump Port: 280 (75) Work Port: 250 (65)	Pump Port: 550 (145) Work Port: 450 (120)
Maximum Pressure Rating kPa (psi)	24,100 (3500)	34,500 (5000)	34,500 (5000)
Maximum Number of Possible Sections	9	5	5
Ride Control Availability	N/A	Yes	Yes
Standard Ports			
Pump Port Size	SAE No. 16	SAE No. 16 (opt. 1" Code-62 4-bolt flange)	1-1/4" (opt. 1-1/2") Code-62 4-bolt flange
Tank Port Size	SAE No. 16	SAE No. 20 (opt. 1-1/4" Code-61 4-bolt flange)	1-1/2" (opt. 2") Code-61 4-bolt flange
LS Output Port Size	SAE No. 6	SAE No. 6	SAE No. 6
Work Port Size	SAE No. 8 (optional No. 10)	SAE No. 16 (opt. 1" Code-62 4-bolt flange)	1-1/4" Code-62 4-bolt flange
Optional Ports			
Pilot Drain Port Size	Optional—SAE No. 6	Optional—SAE No. 6	Optional—SAE No. 6
Pilot Supply Port Size	Optional—SAE No. 6	Optional—SAE No. 6	Optional—SAE No. 6
Pump Gage Port Size	Optional—SAE No. 8	Optional—SAE No. 6	Optional—SAE No. 6
Tank Gage Port Size	N/A	Optional—SAE No. 6	Optional—SAE No. 6
Pilot Accumulator Port Size	Optional—SAE No. 6	Optional—SAE No. 6	Optional—SAE No. 6
LS Input Port Size	Optional—SAE No. 6	Optional—SAE No. 6	Optional—SAE No. 6
Optional Cartridge Valves			
LS Bleed Valve & Orifice	Yes	Yes	N/A
Pilot On/Off Solenoid	Yes	Yes	Yes
Pilot Check Valve	Yes	Yes	Yes
Pressure Reducing Valve	Yes	Yes	Yes
Main Relief[1]	N/A	N/A	Yes
Margin Relief/Fixed Pump Unloading[1]	N/A	N/A	Yes
Optional Work Port Cartridges			
Relief Valve with Anti-Cavitation	Yes	Yes	Yes
Relief Valve	Yes	Yes	Yes
Anti-cavitation	Yes	Yes	Yes
Anti-Drift Valve	Yes	Yes	Yes
Spool Options			
Standard	Yes	Yes	Yes
Motor	Yes	Yes	Yes
4-Position Float	Yes	Yes	Yes
Regen	N/A	Yes	Yes
Swing	N/A	Yes	Yes

[1]It is not possible to have both a Main Relief and a Margin Relief in a valve.

C3PC Valve



Maximum Flow LPM (GPM)

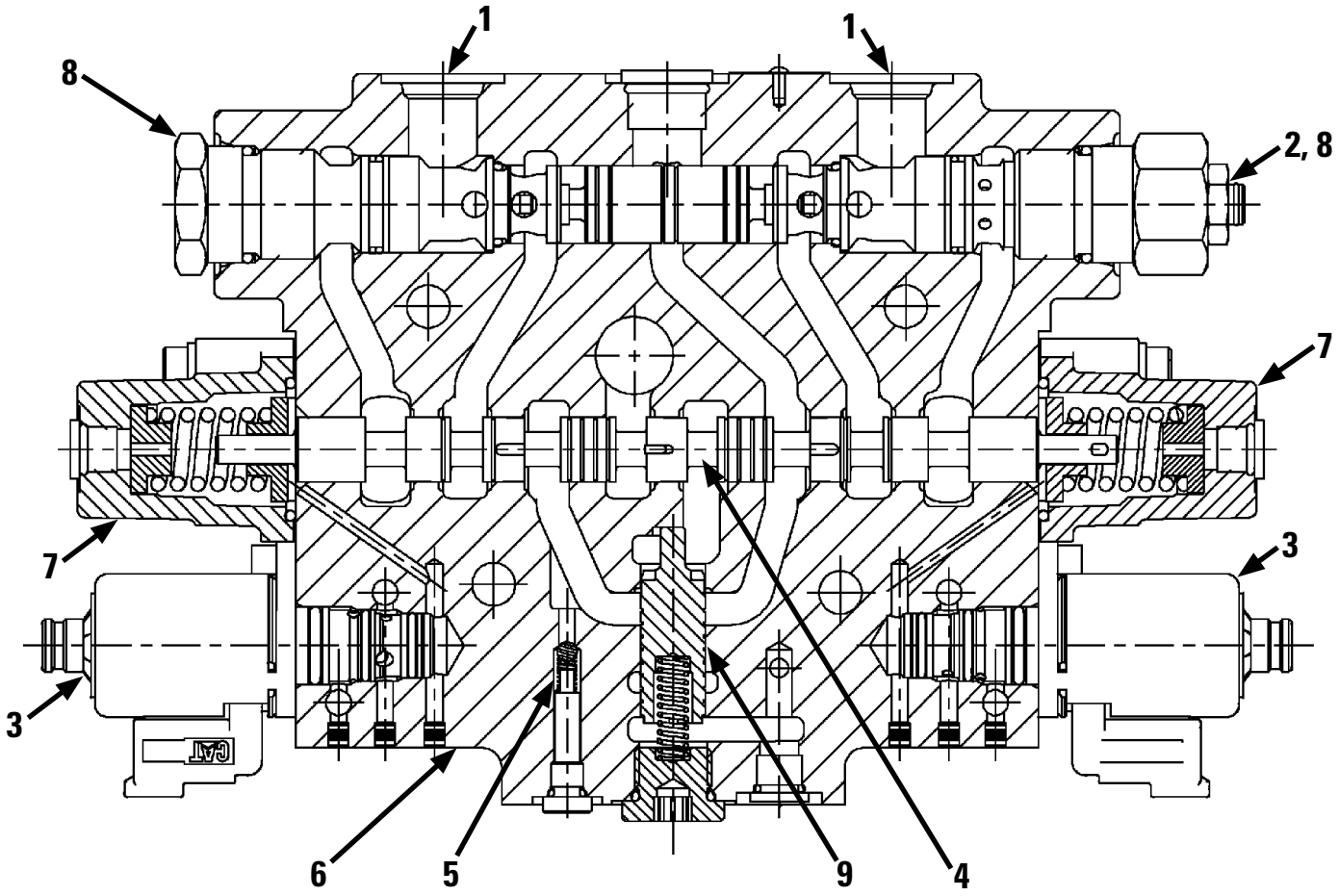
Pump Port: 135 (35)
Work Port: 120 (32)

Maximum Pressure Rating kPa (psi)

24,100 (3500)



C3PC section

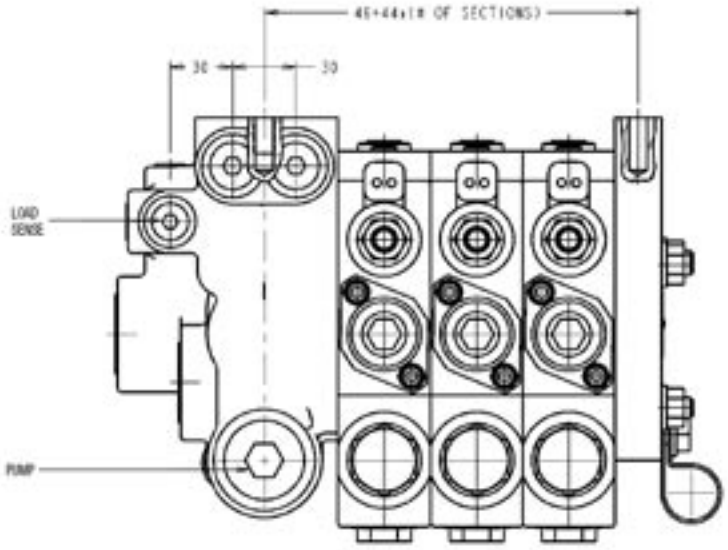


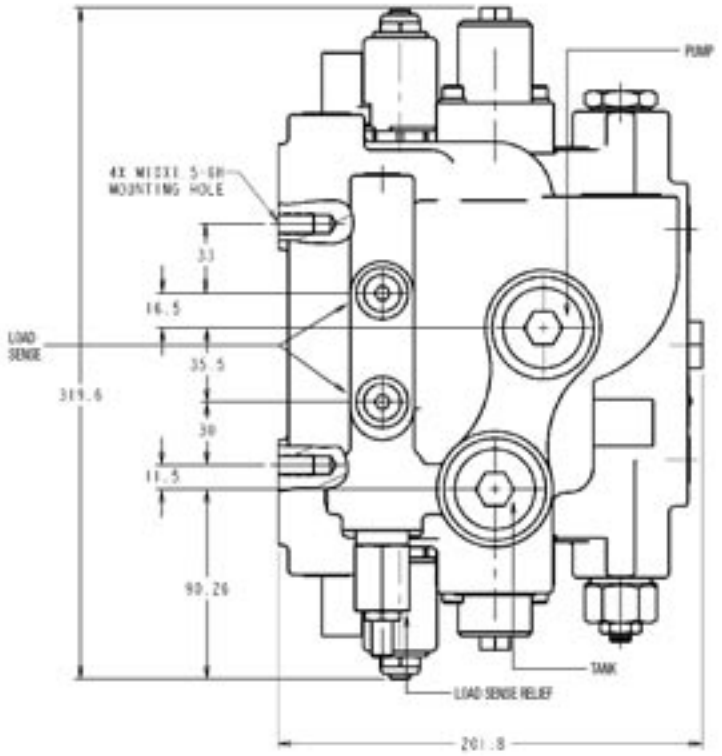
Legend

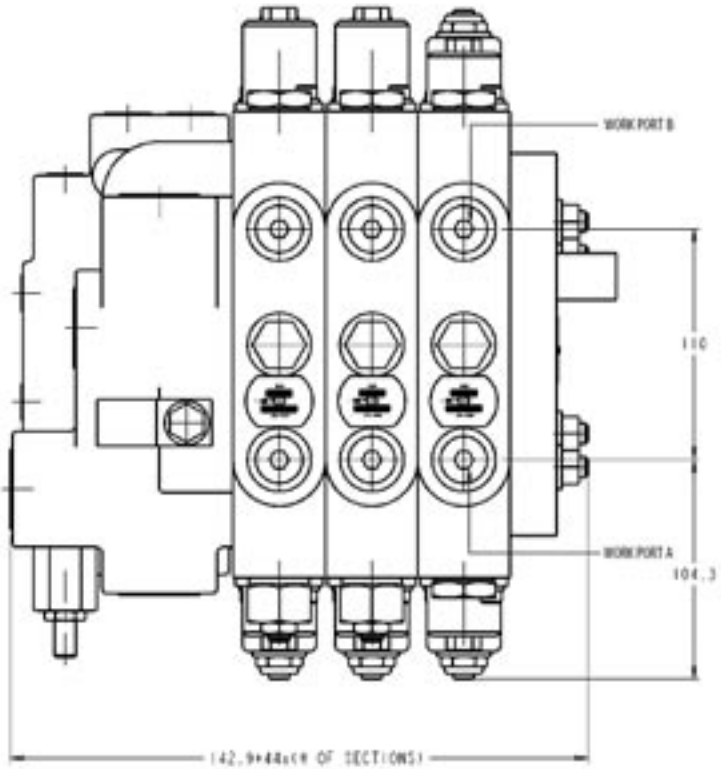
1. Work Ports
2. Line Relief and/or Anti-Cavitation Valve
3. EH Solenoid
4. Main Spool
5. Load Sense Signal Check Valve
6. Valve Body
7. Centering Spring Housing
8. Anti-Drift Valve
9. Pressure Compensator/Pump Check

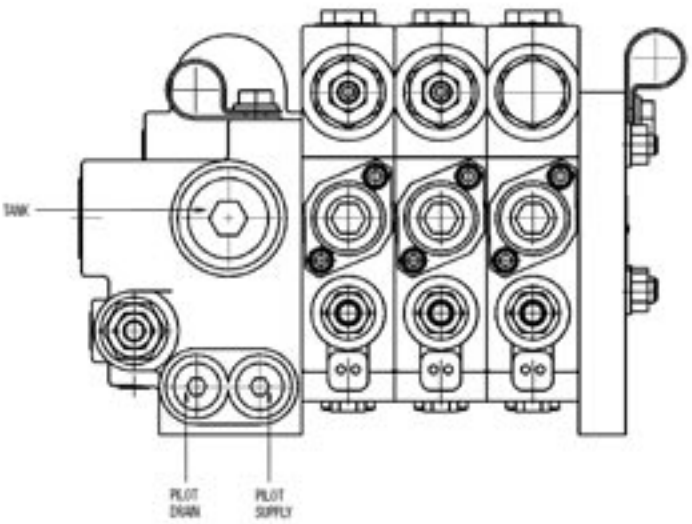
C3PC dimensions

(Dimensions in millimeters)



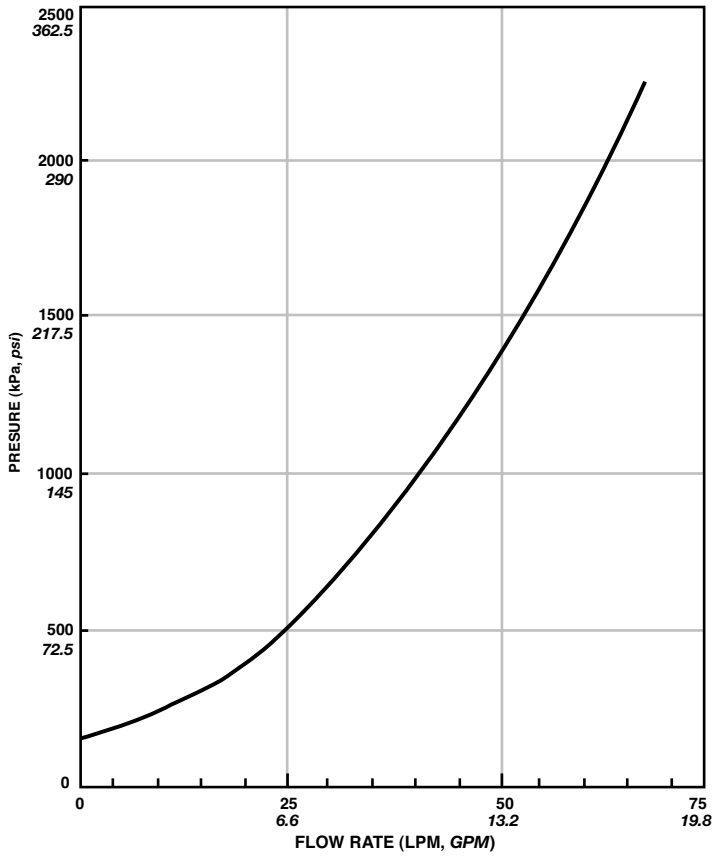




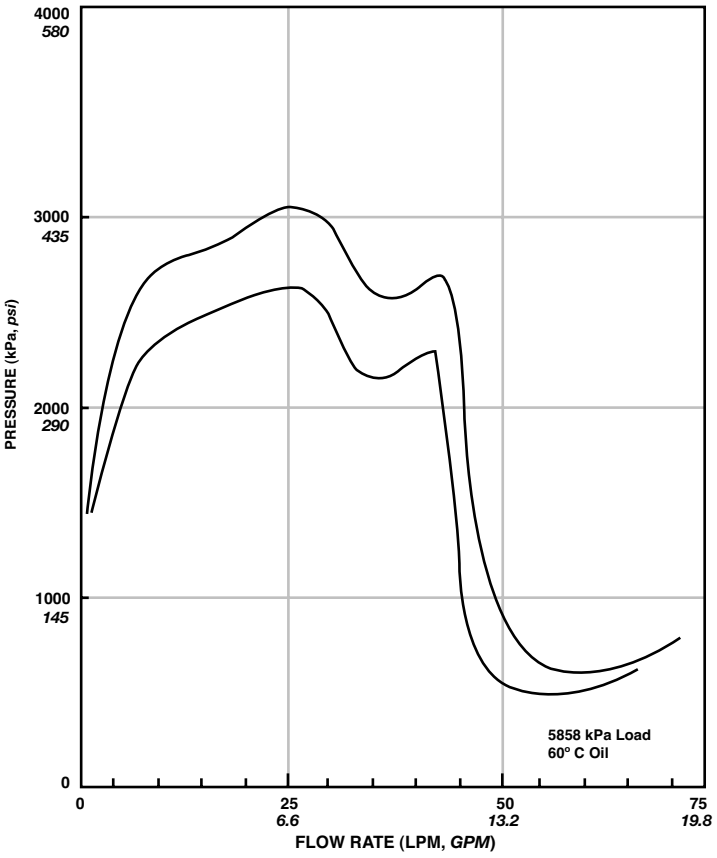


C3PC Charts

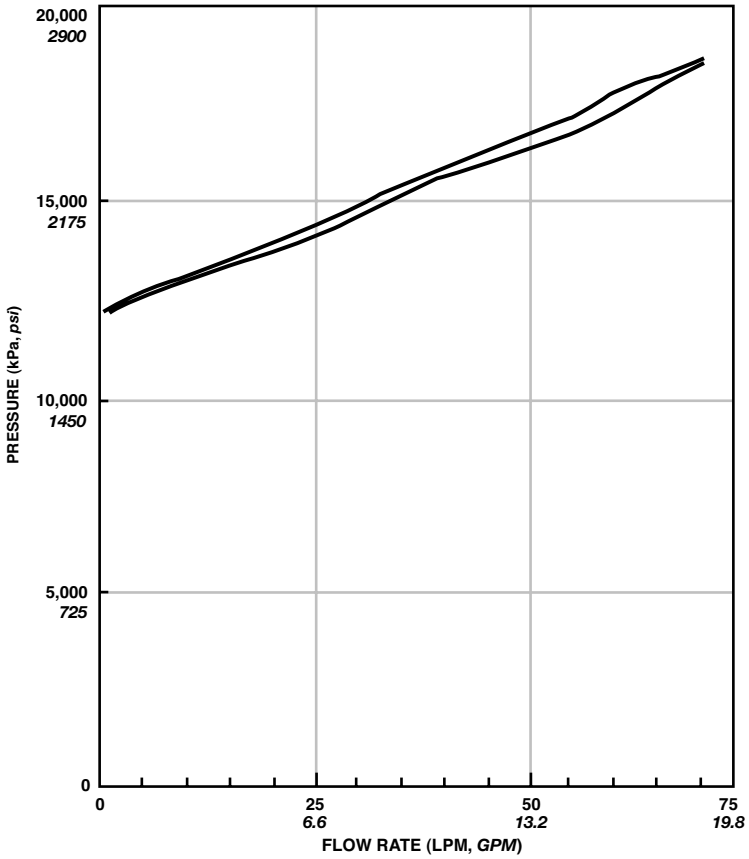
PUMP TO WORKPORT PRESSURE DROP



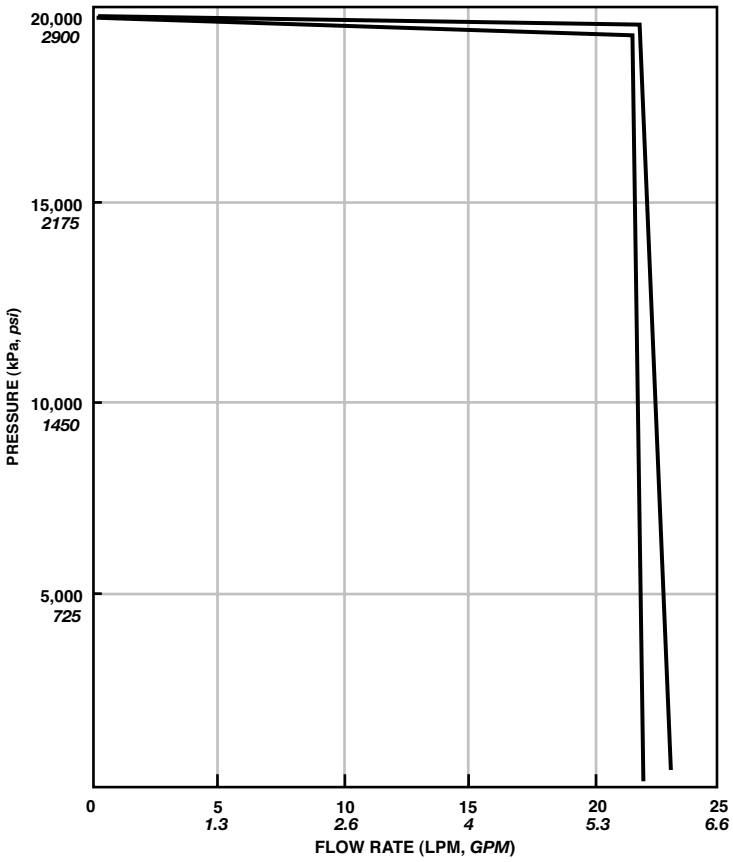
ANTI-DRIFT VALVE PRESSURE DROP



TYPICAL LINE RELIEF PERFORMANCE



TYPICAL LOAD SENSE RELIEF PERFORMANCE



S3PC Valve





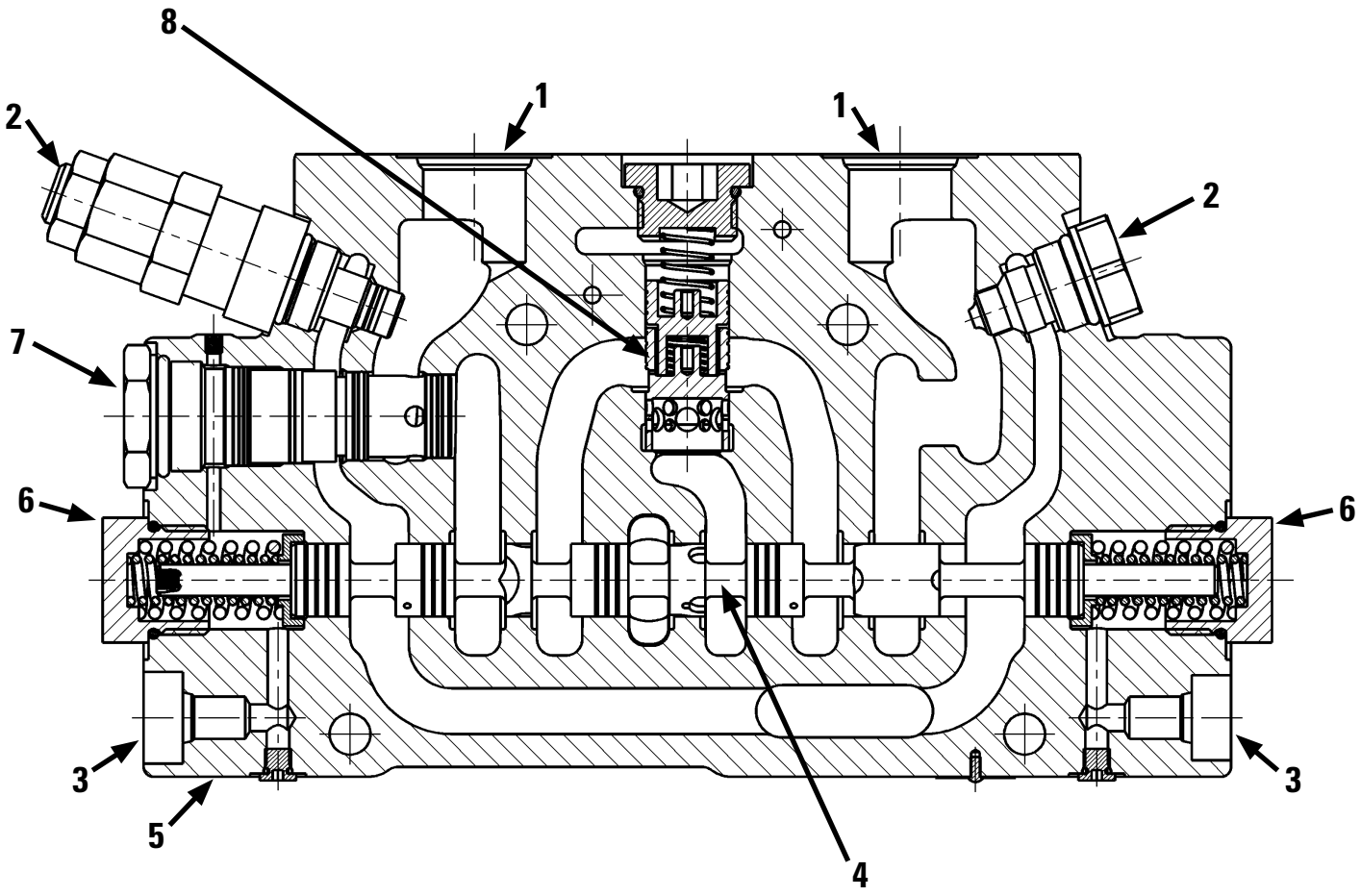
Maximum Flow LPM (GPM)

Pump Port: 280 (75)
Work Port: 250 (65)

Maximum Pressure Rating kPa (psi)

34,500 (5000)

S3PC Valve

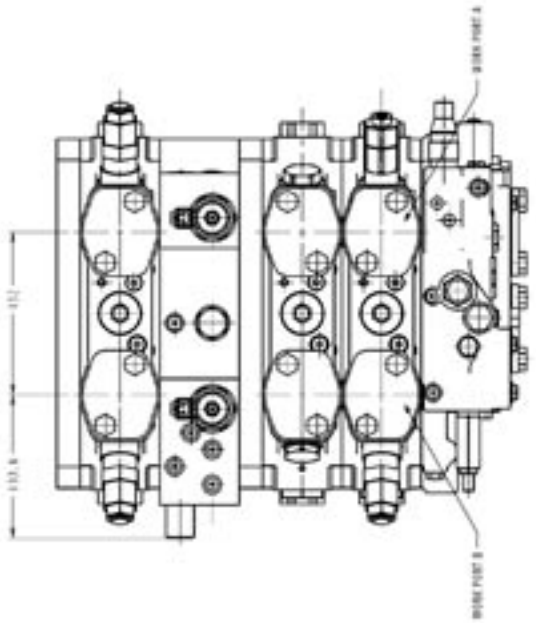


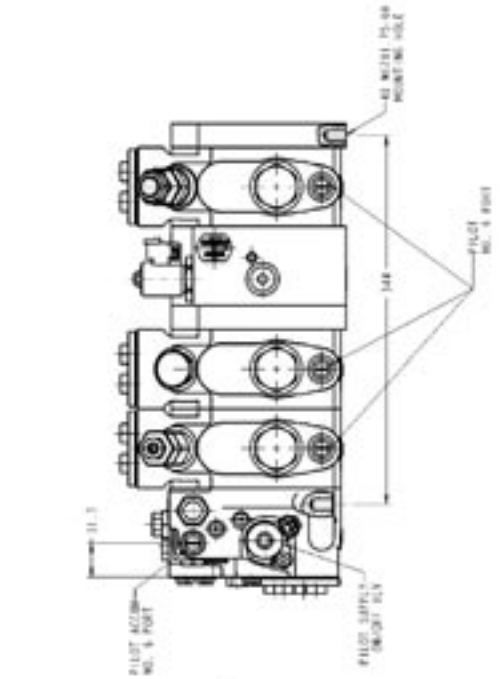
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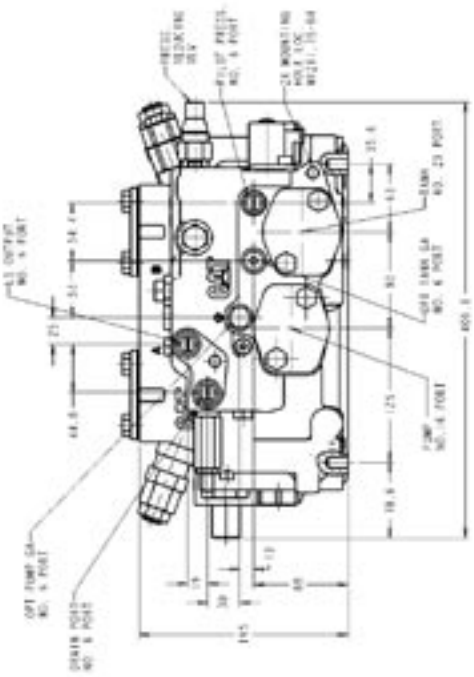
1. Work Ports
2. Line Relief and/or Anti-Cavitation Valve
3. Pilot Port/Solenoid Location
4. Main Spool
5. Valve Body
6. Spring Housing
7. Anti-Drift Valve
8. Pressure Compensator/Pump Check

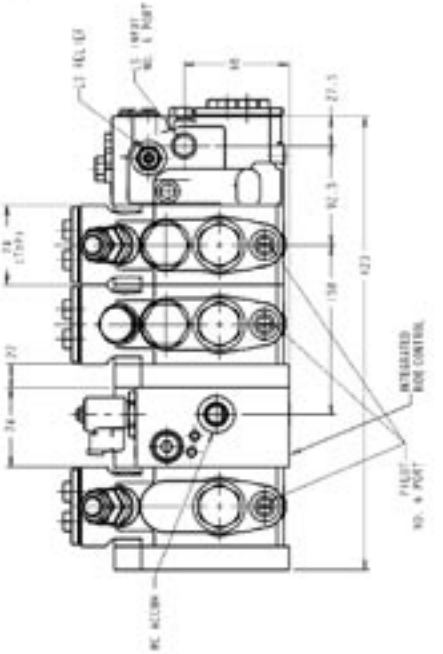
S3PC dimensions

(Dimensions in millimeters)



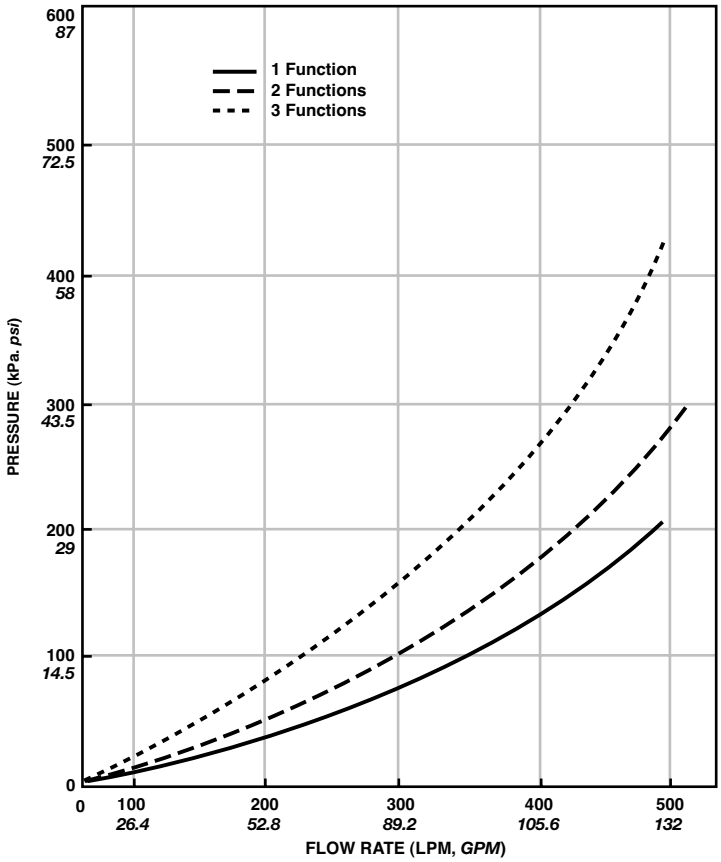




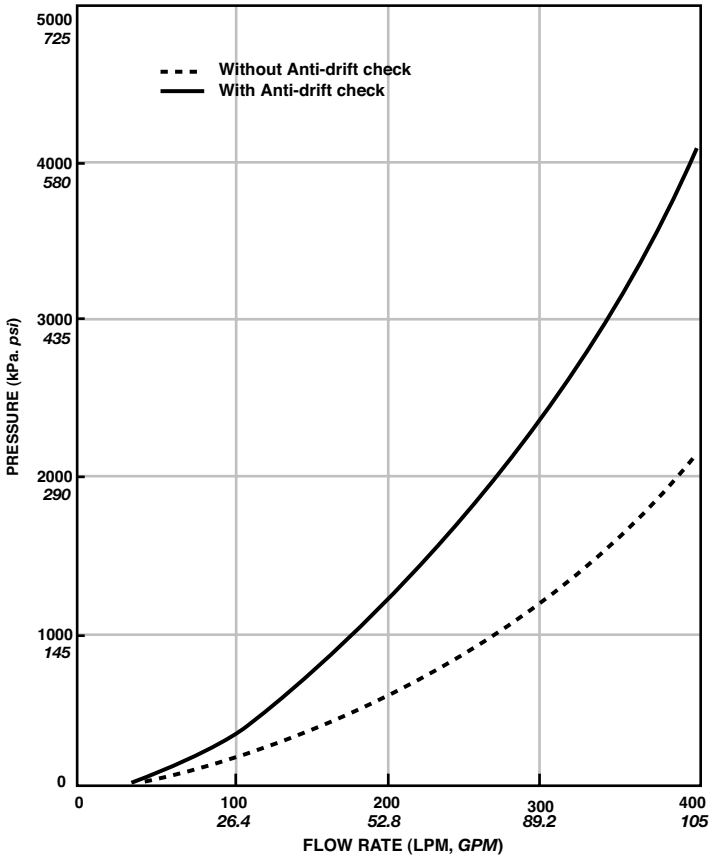


S3PC charts

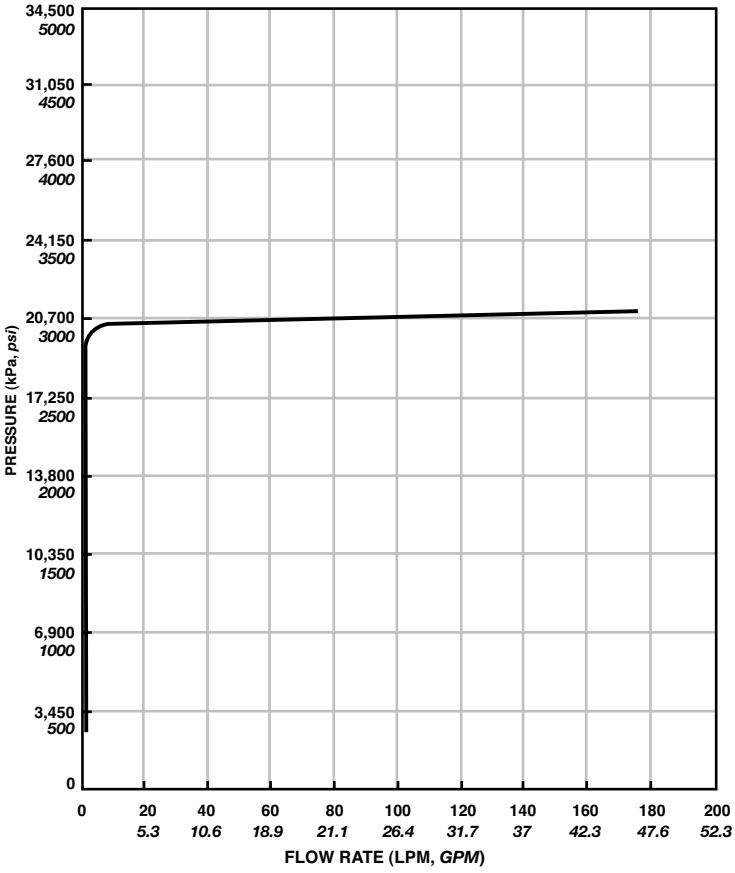
PUMP TO WORKPORT PRESSURE DROP



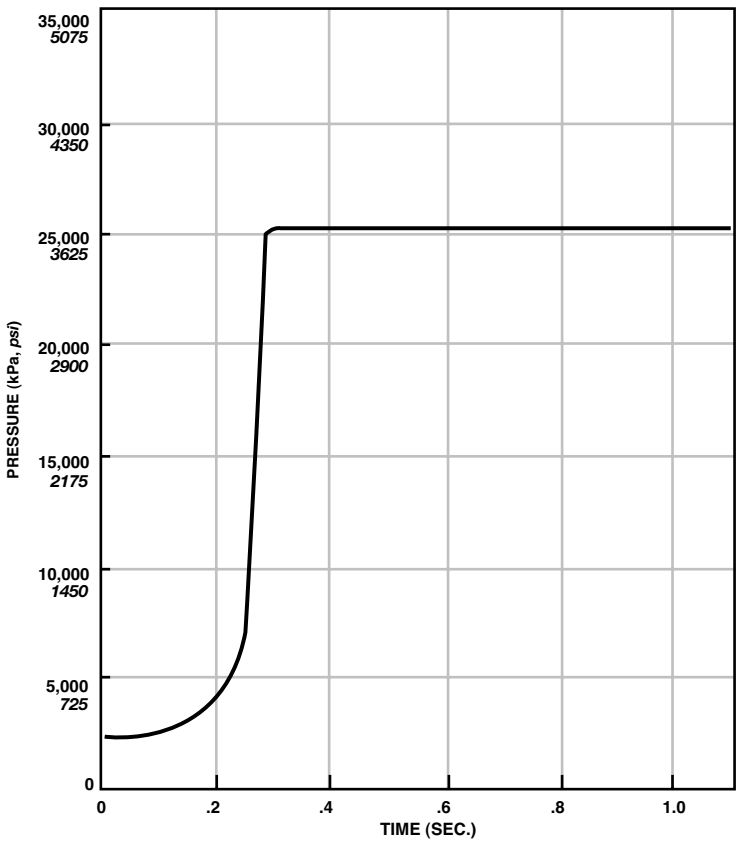
ANTI-DRIFT VALVE PRESSURE DROP



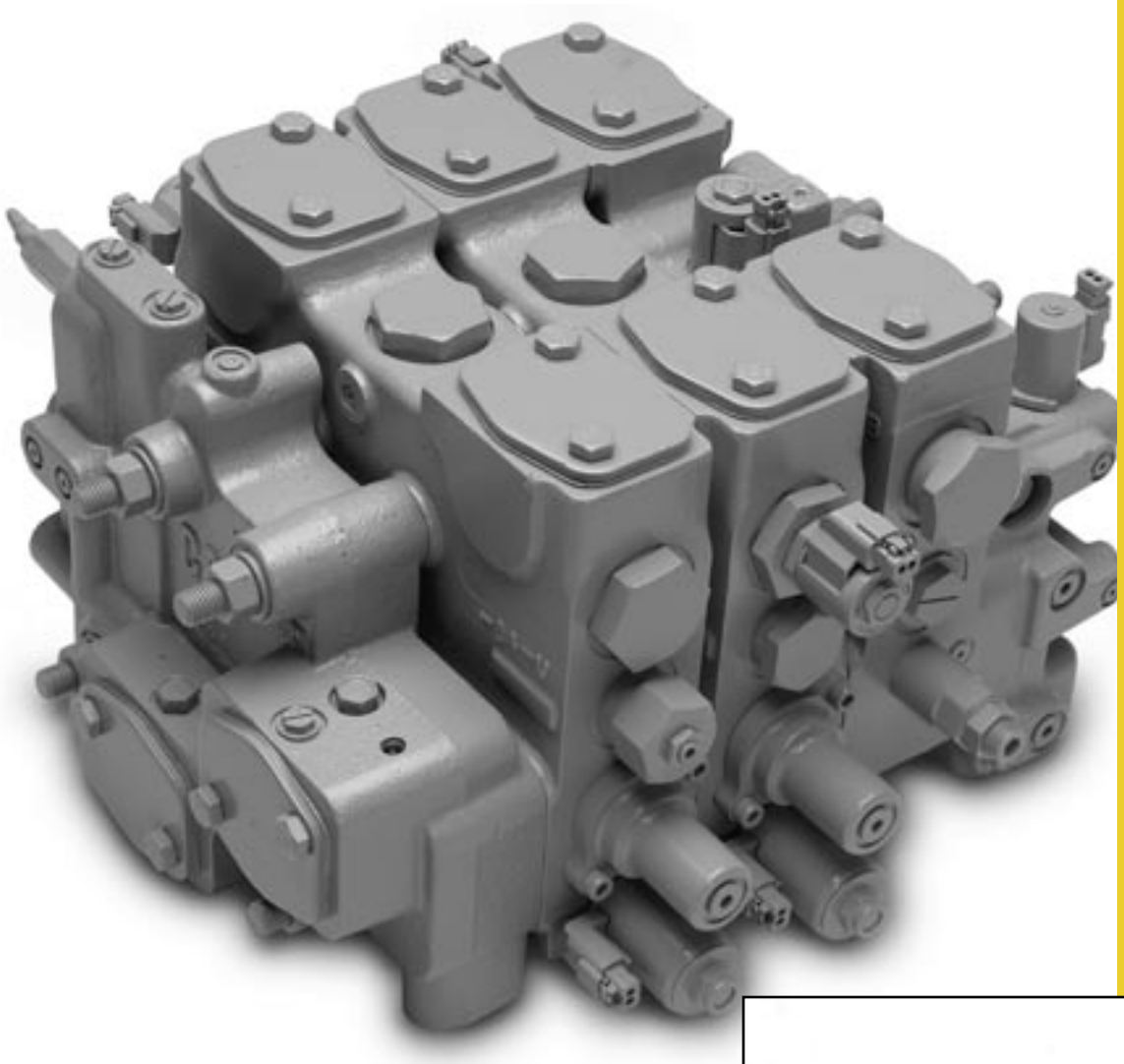
TYPICAL LINE RELIEF PERFORMANCE



TYPICAL LOAD SENSE RELIEF PERFORMANCE



M3PC Valve



Maximum Flow LPM (GPM)

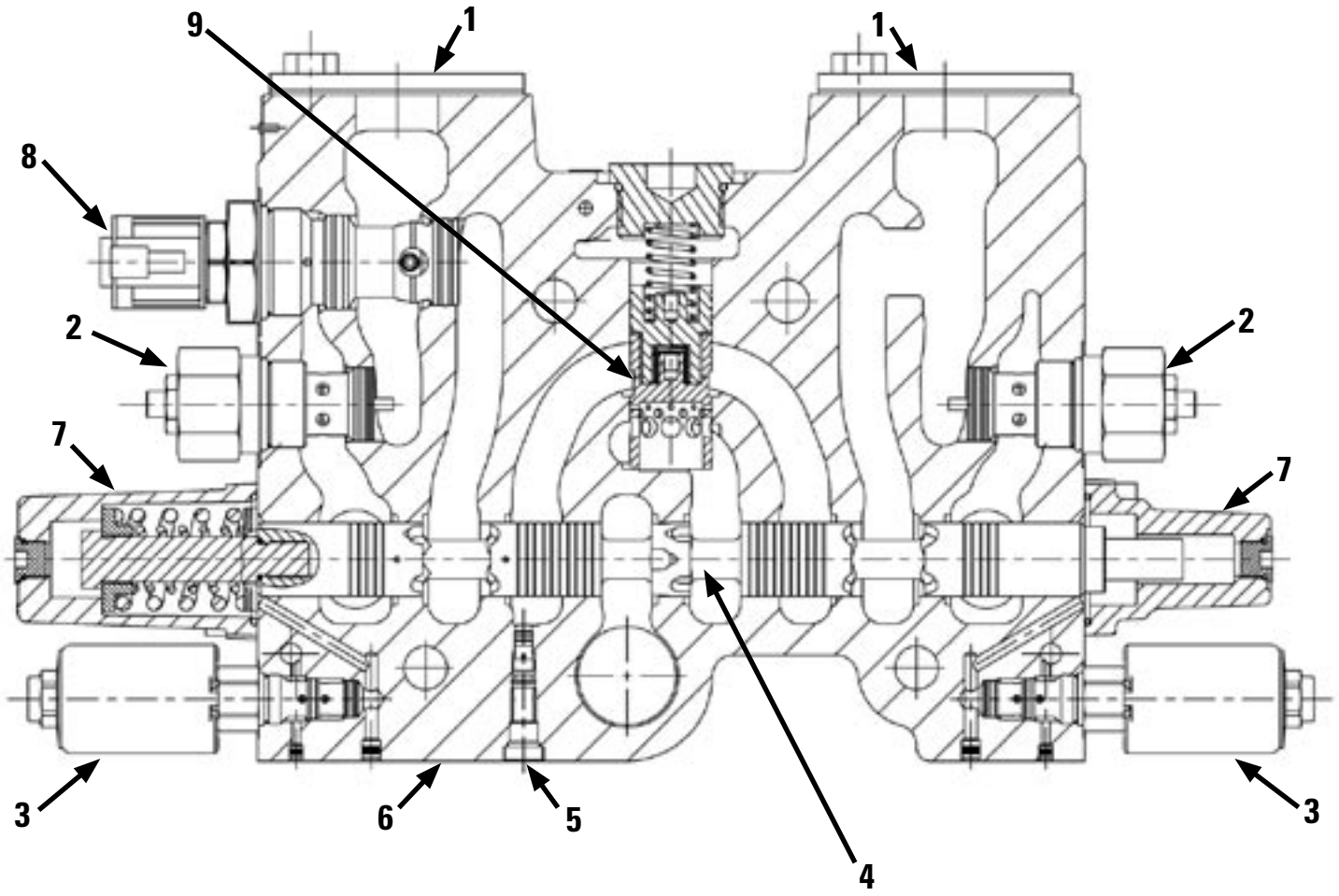
Pump Port: 550 (145)
Work Port: 450 (120)

Maximum Pressure Rating kPa (psi)

34,500 (5000)



M3PC Valve

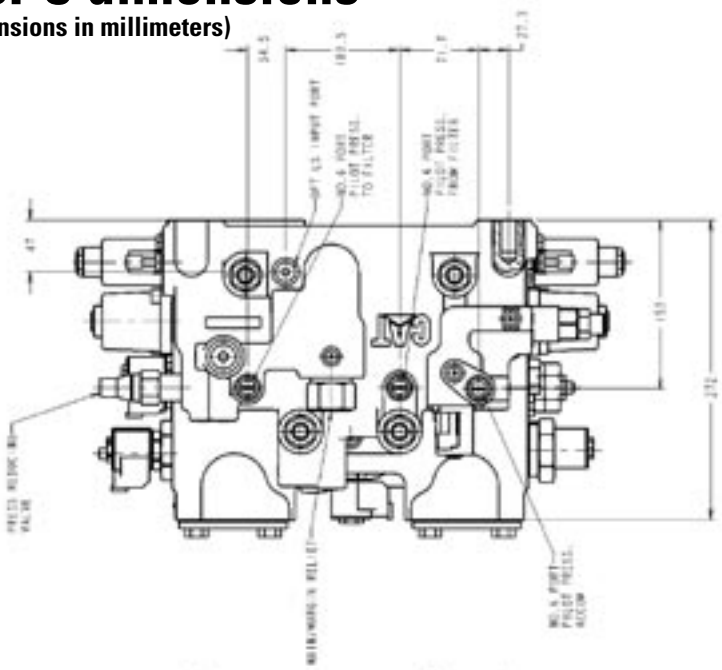


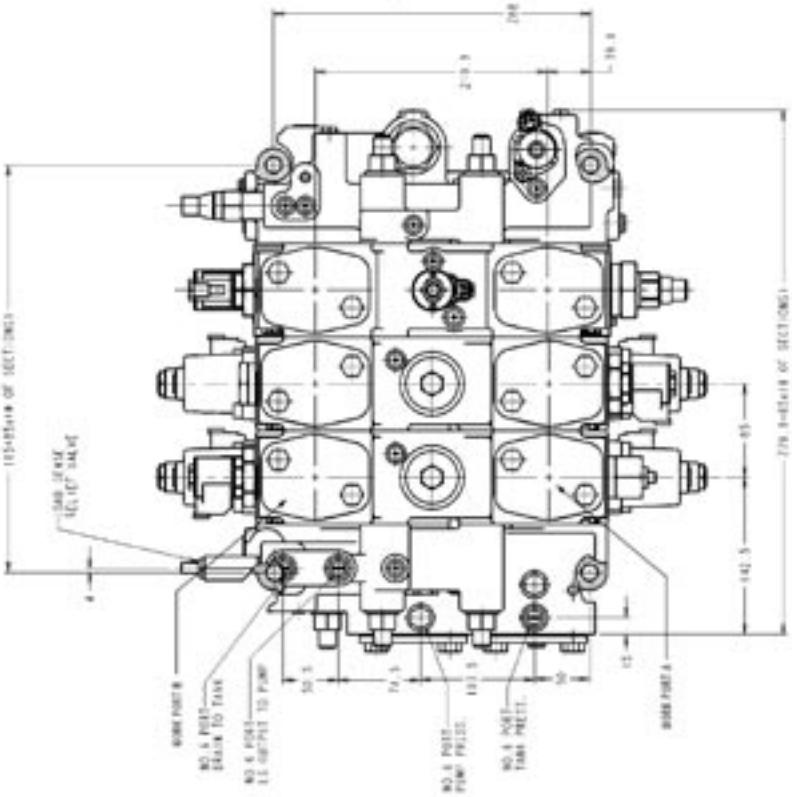
Legend

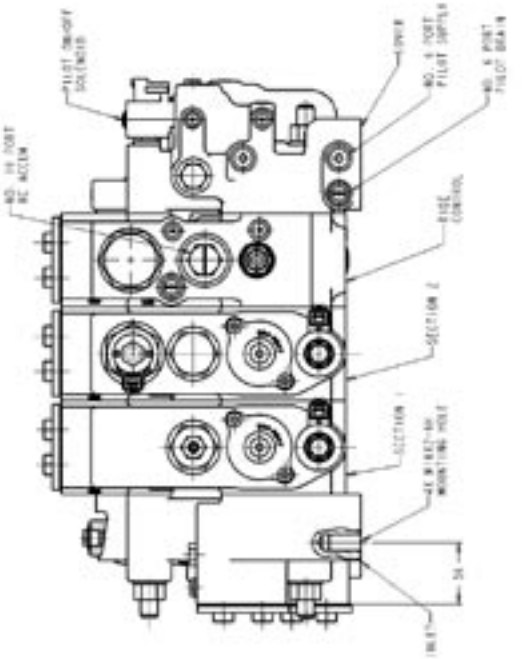
1. Work Ports
2. Line Relief and/or Anti-Cavitation Valve
3. EH Solenoid
4. Main Spool
5. Load Sense Signal Resolver
6. Valve Body
7. Spring Housing
8. Anti-Drift Valve
9. Pressure Compensator/Pump Check

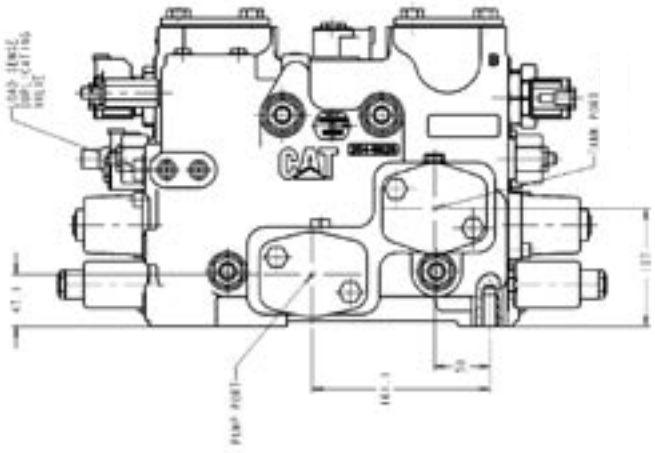
M3PC dimensions

(Dimensions in millimeters)



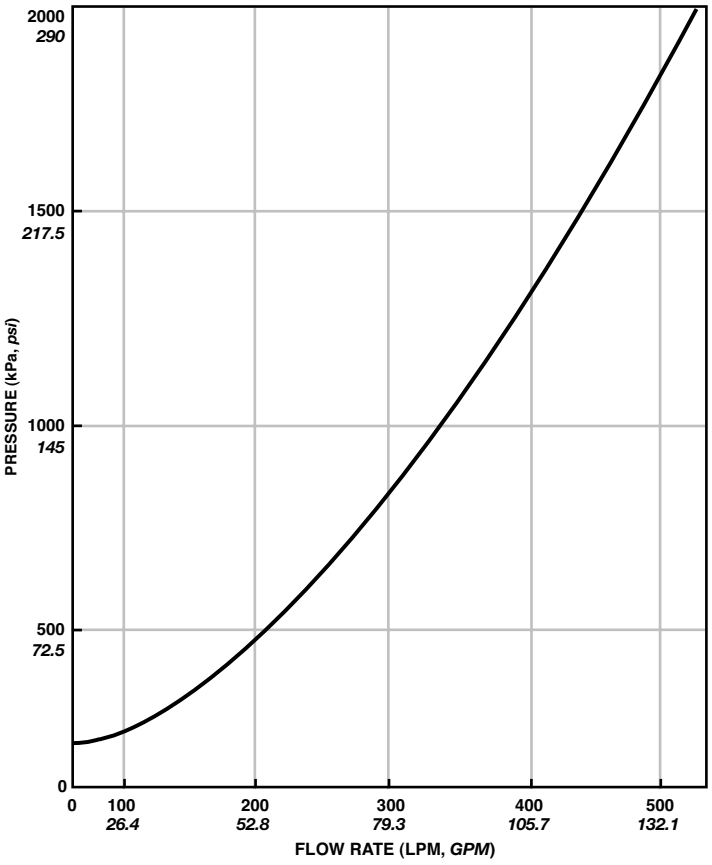




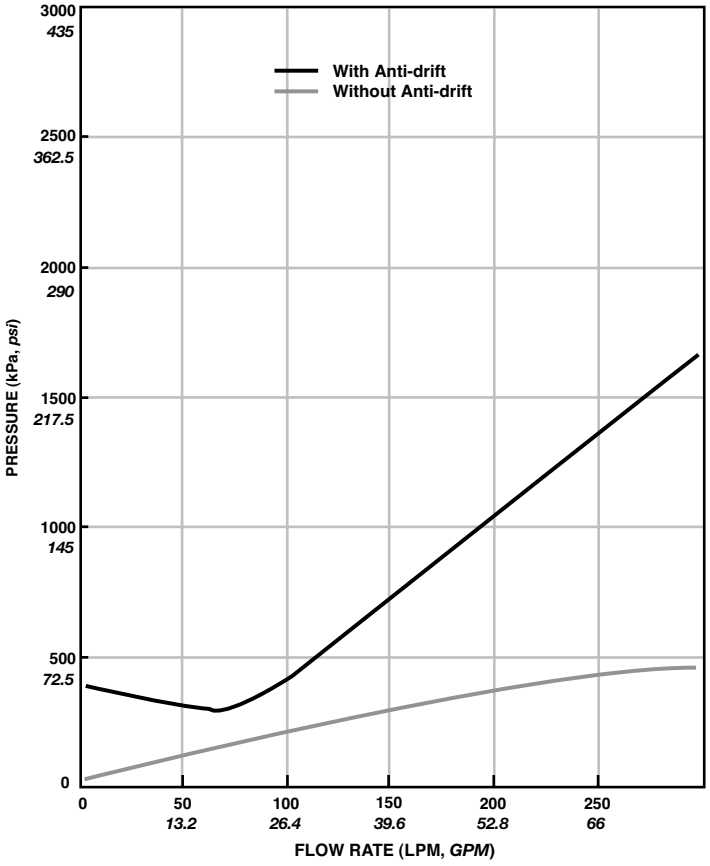


M3PC charts

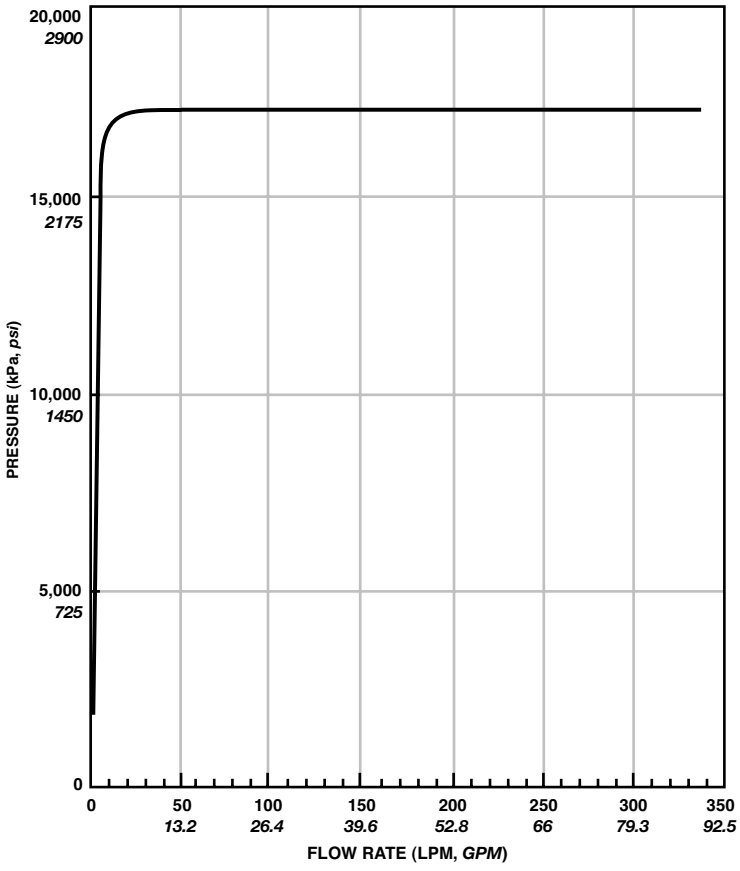
PUMP TO WORKPORT PRESSURE DROP



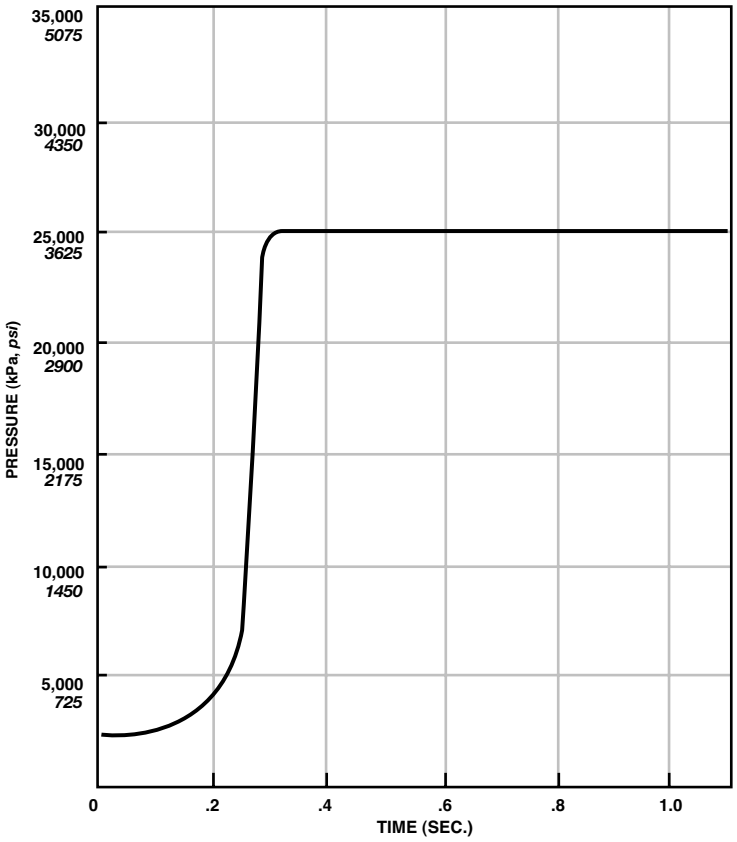
ANTI-DRIFT PRESSURE DROP



TYPICAL LINE RELIEF PERFORMANCE

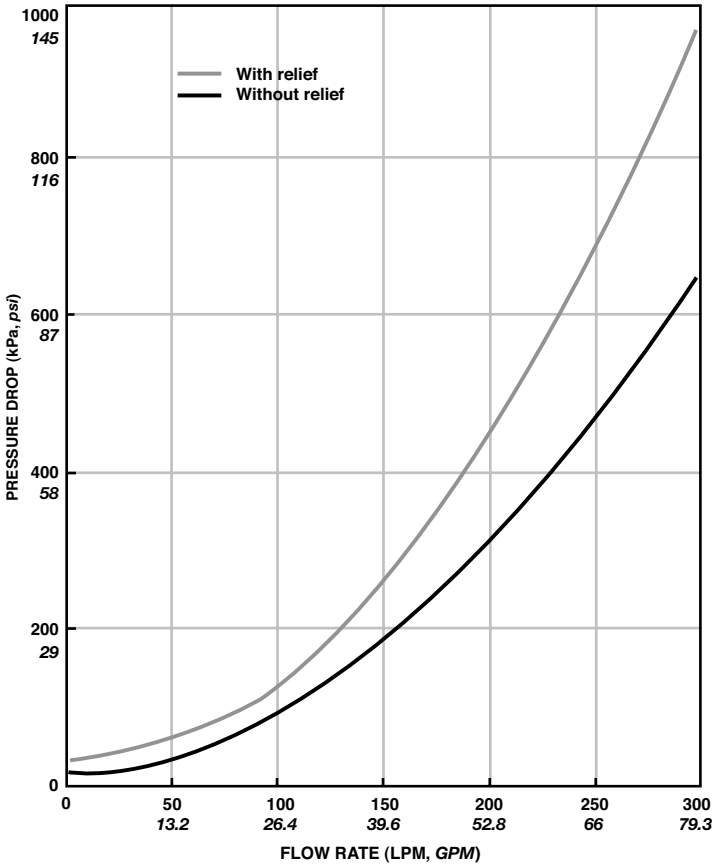


TYPICAL LOAD SENSE RELIEF PERFORMANCE

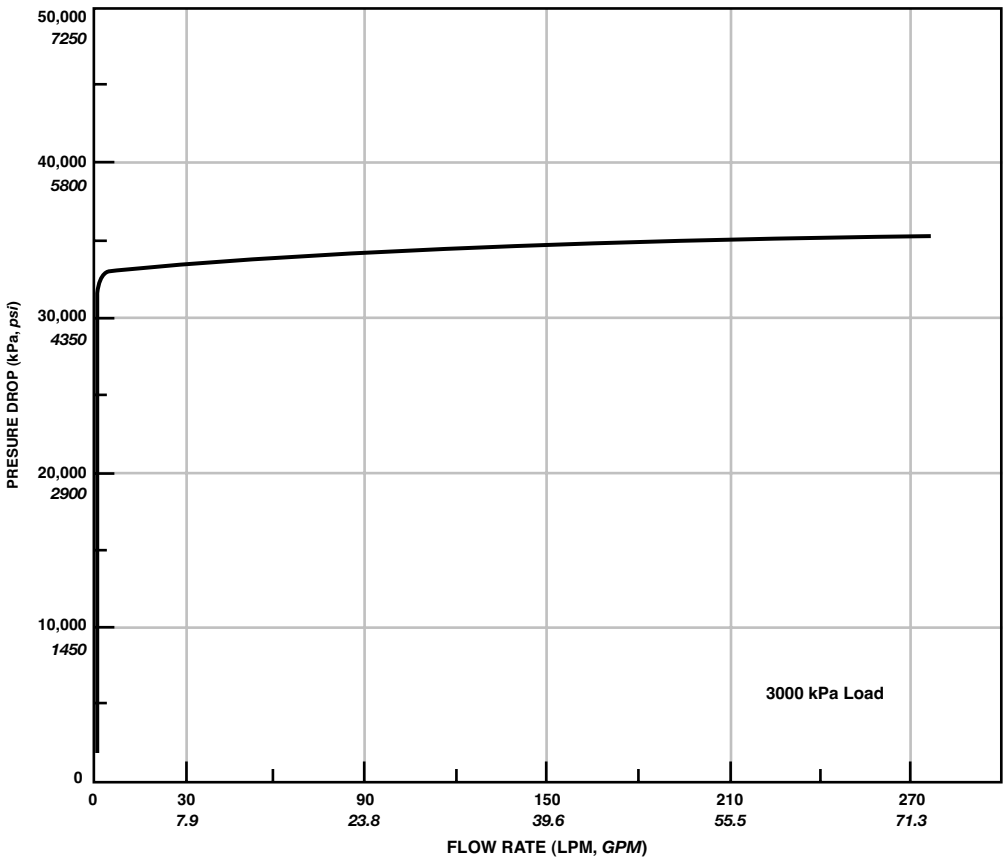


M3PC charts

TYPICAL PERFORMANCE FOR VALVES CONTAINING ANTI-CAVITATION

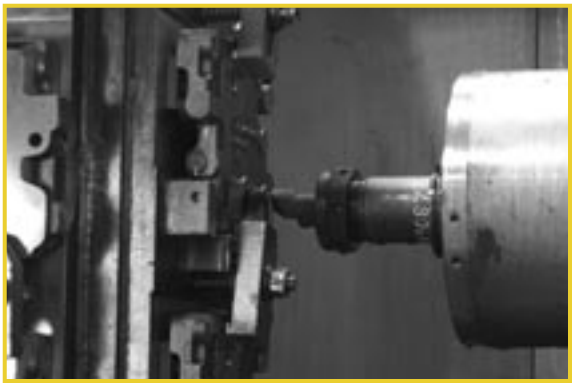


TYPICAL MARGIN RELIEF PERFORMANCE

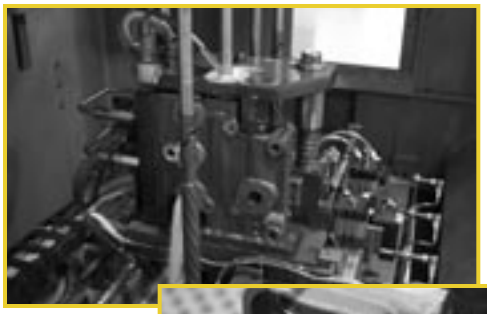


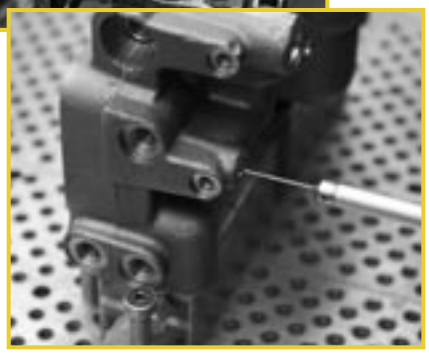
Building to your requirements

The toughness and durability of every Cat component begins with innovative engineering. Utilizing sophisticated processes such as finite element analysis, computational fluid dynamics and a proprietary system simulation tool, components are designed to meet the challenges of the most demanding applications, and the harshest of working environments.



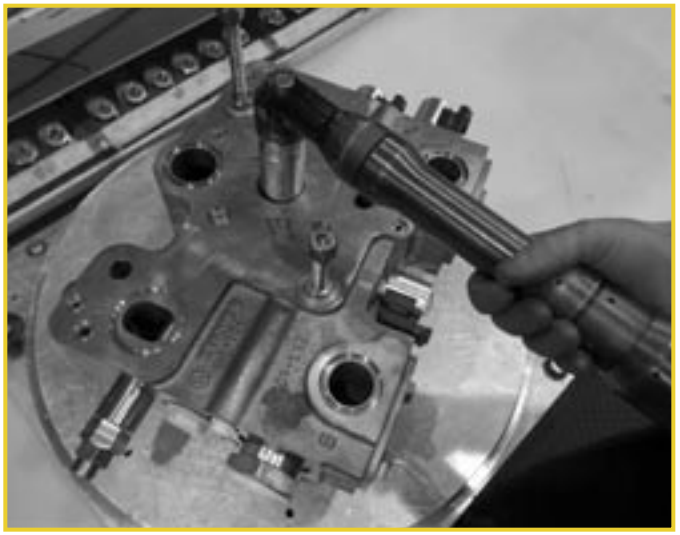
Caterpillar's global manufacturing capabilities include facilities dedicated to hydraulic valve manufacturing. Our manufacturing materials and processes meet or exceed ASTM, DIN, ISO and SAE standards. We follow the 6 Sigma methodology, which provides an integrated, disciplined, and proven approach for delivering exceptional quality, with an enhanced lifecycle value.





With a reputation for building rugged and reliable equipment, Caterpillar has the production facilities, technical capabilities, testing and quality processes necessary to produce valves to meet your application requirements.

Caterpillar can incorporate enhanced technologies such as electrohydraulics or programmable hydraulic systems. In addition, systems can be designed to include pumps, motors, cylinders, fans, brakes, steering systems, hydrostatic transmissions, joysticks and much more—enabling you to meet your customers' unique requirements.



Appendix



Glossary



Anti-Cavitation: A cartridge valve which passes flow from tank to the work port in order to replenish or "make-up" voided volume of oil in an actuator connected to the work port.

Anti-Drift: A cartridge valve used to reduce work port leakage. This valve is typically a pilot operated check valve, which can be used to allow lowering of a gravity load.

Float Spool: A spool designed to connect work ports to the tank (return) port, usually in a fourth position, allowing a cylinder or motor to "float".



Margin Relief/Fixed Pump Unloading Valve: This cartridge valve opens in response to an external pilot pressure and diverts pump flow directly to tank.

Motor Spool: A spool design which connects both work ports to tank in the neutral state.

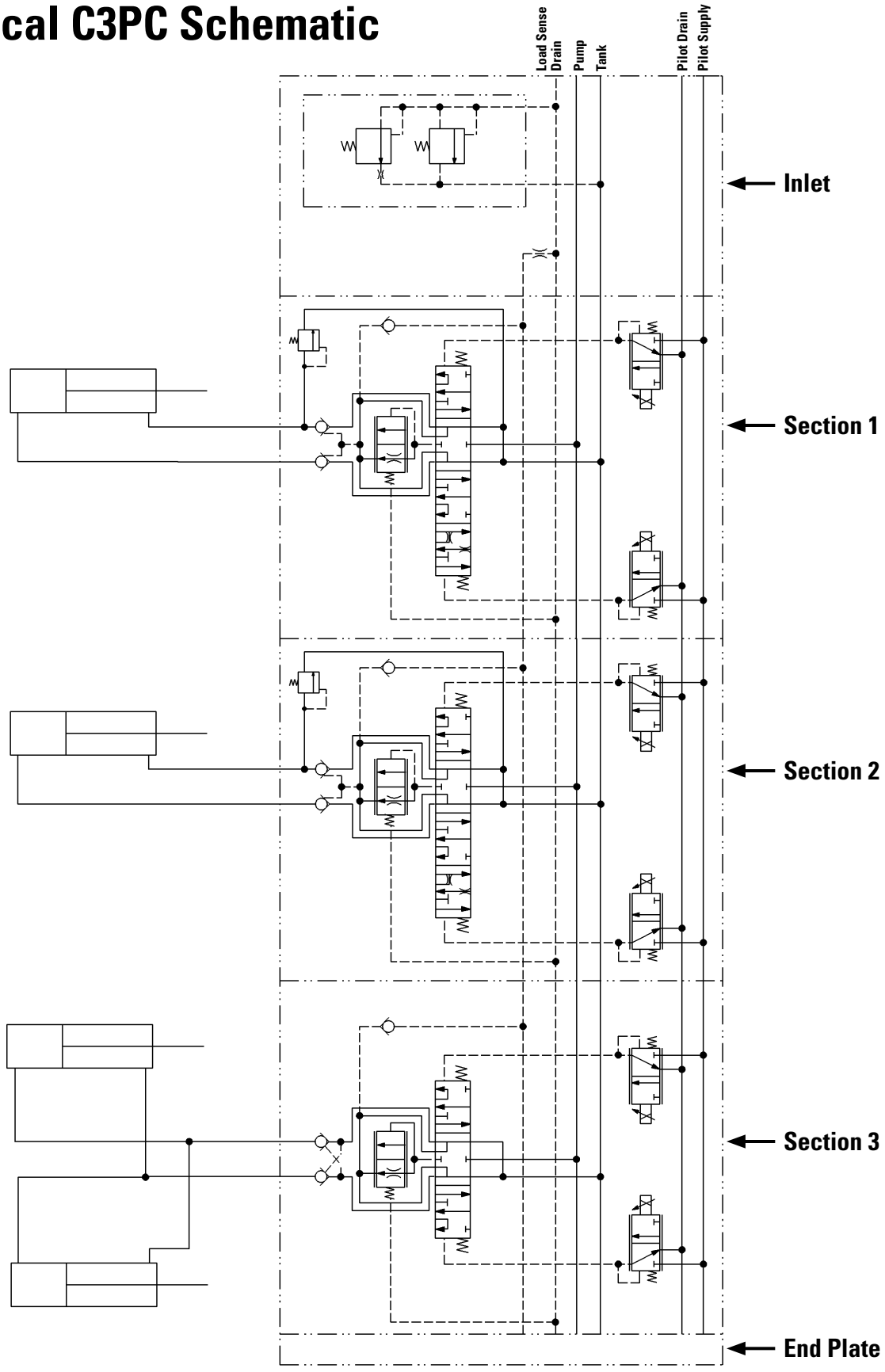
Pressure Reducing Valve: A cartridge valve used to maintain a reduced pressure in a portion of the hydraulic circuit, usually for use in a pilot circuit.



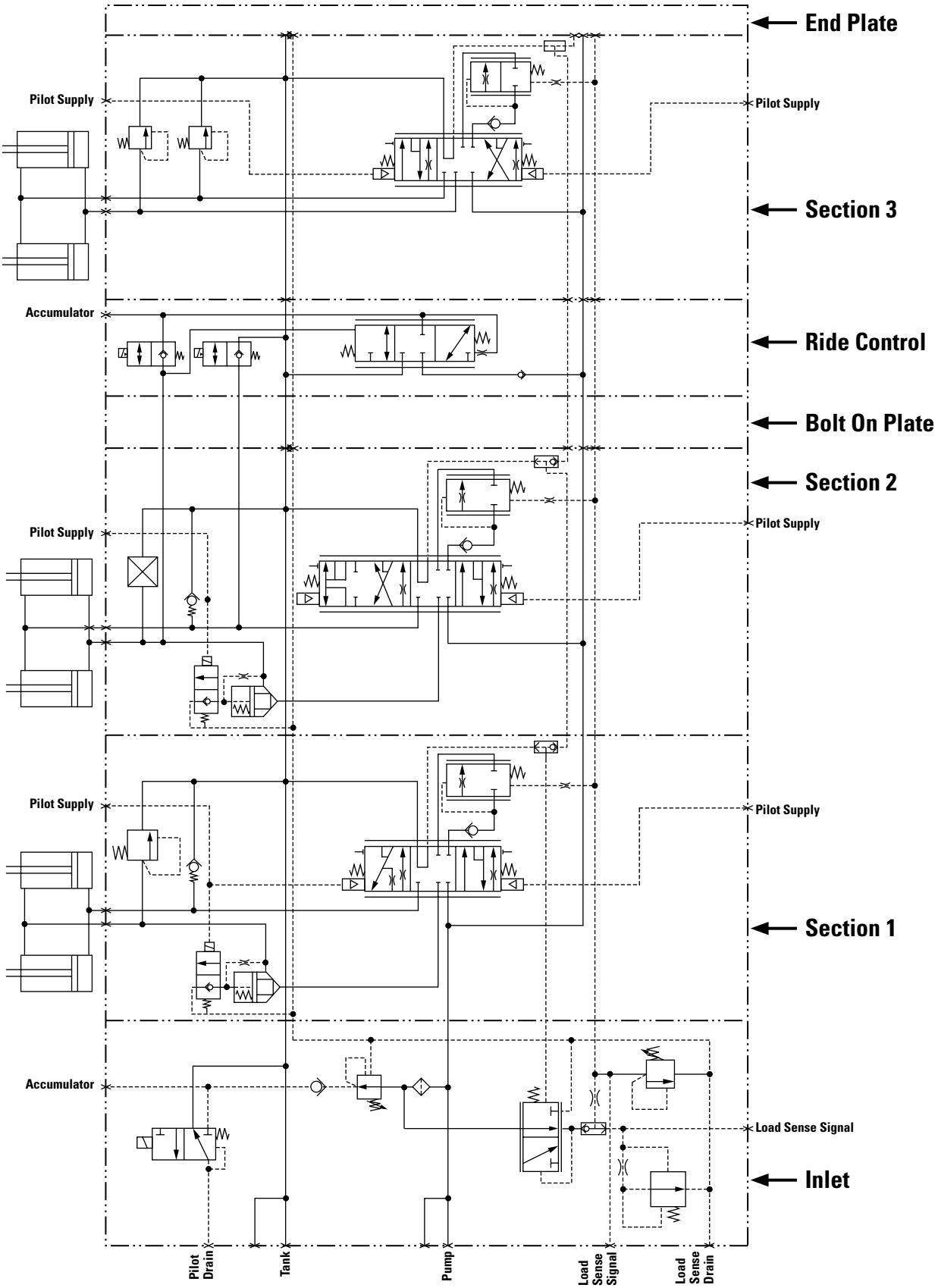
Ride Control: A valve to control the connection of lifting cylinders to an accumulator which acts as a shock absorber, allowing the lift cylinders to move independently of the machine while traveling.

Work Ports: Ports on the hydraulic valve where the connections are made to an external circuit, sometimes termed cylinder ports.

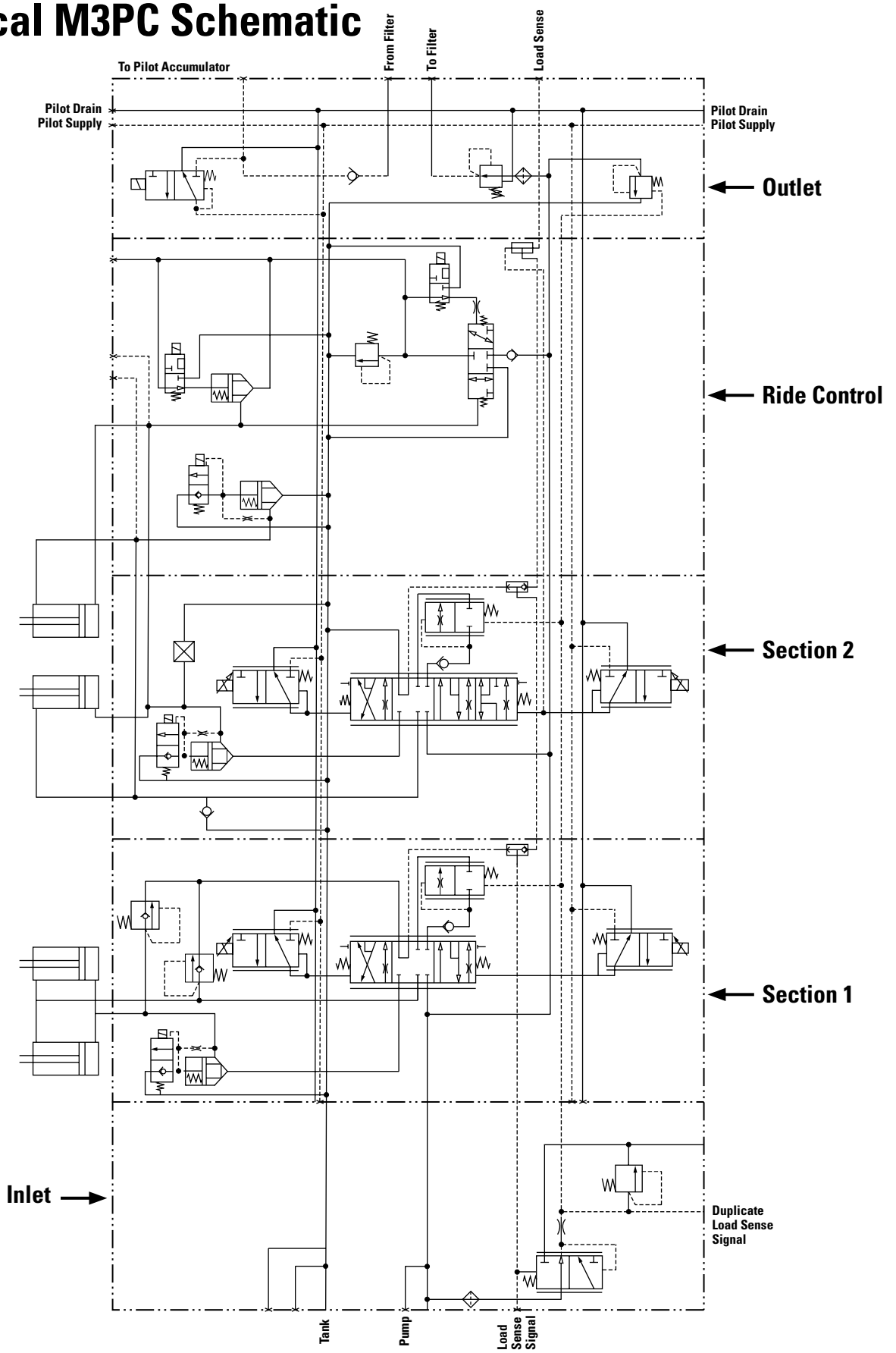
Typical C3PC Schematic



Typical S3PC Schematic



Typical M3PC Schematic



Other Specifications and Options

Approximate Weight (kg)	C3PC	S3PC	M3PC
Inlet	13	18.5	25.8
Outlet	4.9	7.6	24.3
Section			
-Pilot	9.2	22.2	36.7
-EH	9.8	22.8	37.3
-Ride Control	N/A	23.7	37.7
Options			
-LS Bleed Valve	0.1	0.2	N/A
-Pilot On/Off Solenoid	0.2	0.2	0.2
-Pilot Check Valve	0.1	0.1	0.1
-Pressure Reducing Valve	0.3	0.3	0.3
-Main/Margin Relief	N/A	N/A	0.4
-Relief Valve with Anti-Cavitation	0.3	0.5	0.4
-Relief Valve	0.3	0.5	0.4
-Anti-cavitation Valve	0.1	0.1	0.3
-Anti-drift Valve	0.6	0.5	0.9

Electro-Hydraulic Actuator Specifications	
Operating Voltage	12 VDC or 24 VDC
Coil Resistance	
-12V Proportional (1.0 A)	12 ohms
-24V Proportional (2.0 A)	12.6 ohms
-12V On/Off	10 ohms
-24V On/Off	38.6 ohms
PWM Frequency	
-12V Proportional (1.0 A)	100 Hz, 112 mA Peak to Peak
-24V Proportional (2.0 A)	50 Hz, 200 mA Peak to Peak
Pilot Pressure Requirements	
-Minimum Pressure	3100 kPa
-Maximum Pressure	3500 kPa
Flow (minimum)	15 LPM
Fluid & Ambient Temperature	-40˚C to 105˚C
Recommended Fluid	SAE 10 to SAE 30
Recommended Filtration	10 microns (nominal)
Connector	Deutsch

How to obtain a quote

1) Important: Copy the following inquiry form and the order form(s) before providing any information.

2) Using the copied documents, complete the inquiry form and the order form(s) corresponding to the valve series of interest (for compact, C3PC; small, S3PC; and medium, M3PC valves).

3) Fax the inquiry form and the order form(s) to your nearest OEM Solutions location (listed on top of the inquiry form). Provide us with as complete a response as possible—we'll help you fill in the blanks.

If you have any questions, please contact your nearest OEM Solutions location which can be found on the back cover.

We appreciate your privacy concerns. Your response will be used only to provide you with information on Cat 3PC Valves. It will not be used for any other purpose.

Product availability

Please call for availability. Generally, allow 8 to 12 weeks after placing your order for completed valves to be shipped.

3PC valve inquiry form

Fax to: OEM Solutions Group

U.S.A.: 1.309.636.1087 **Switzerland: 41.22.849.4075** **Singapore: 65.6.662.8347**

Contact (please print) _____

Company _____

Phone_____Fax_____

E-mail _____

3PC Valve Information Request

Estimated annual usage of product to be equipped with 3PC Valve(s):

_____

Describe your vehicle:

Year _____ Manufacturer _____ Model _____

Briefly describe use of vehicle and environment (ex. loading and dumping): _____

_____

_____

Customization request: _____

_____

_____

_____

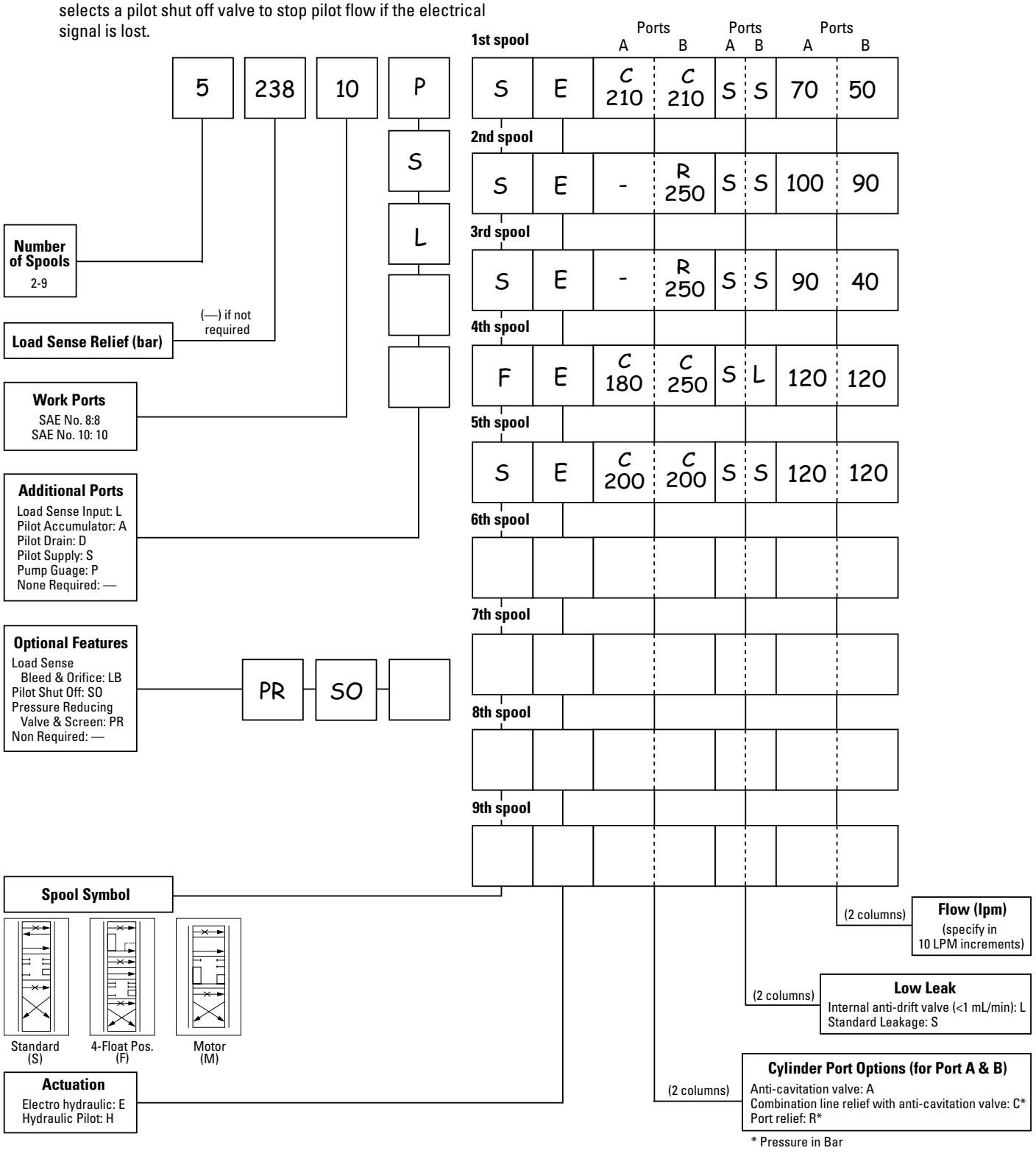
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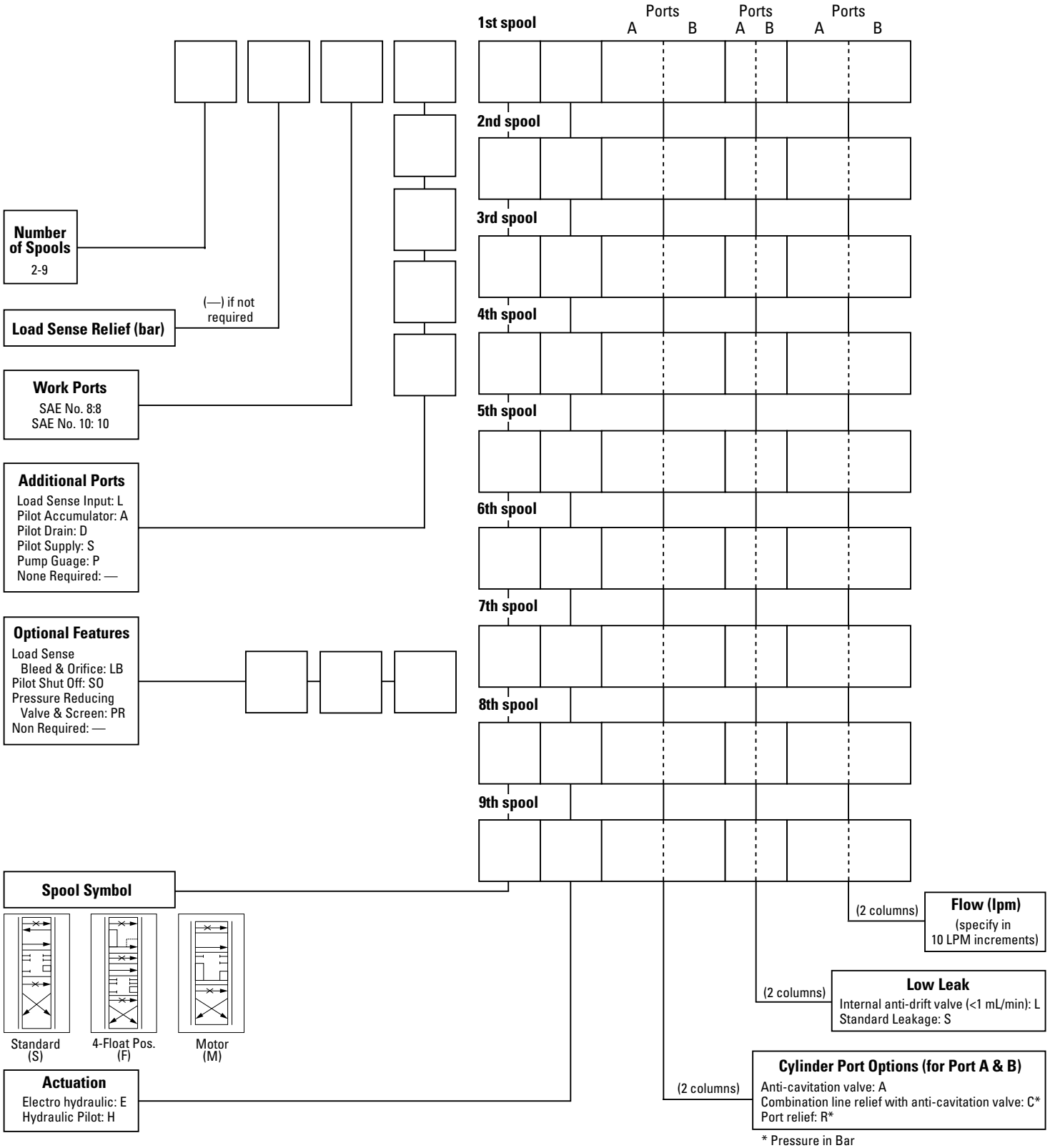
C3PC ordering example

Example Order Detail: After evaluating the 3PC valve family, the customer determines his needs and completes the appropriate order detail below based on the following requirements:

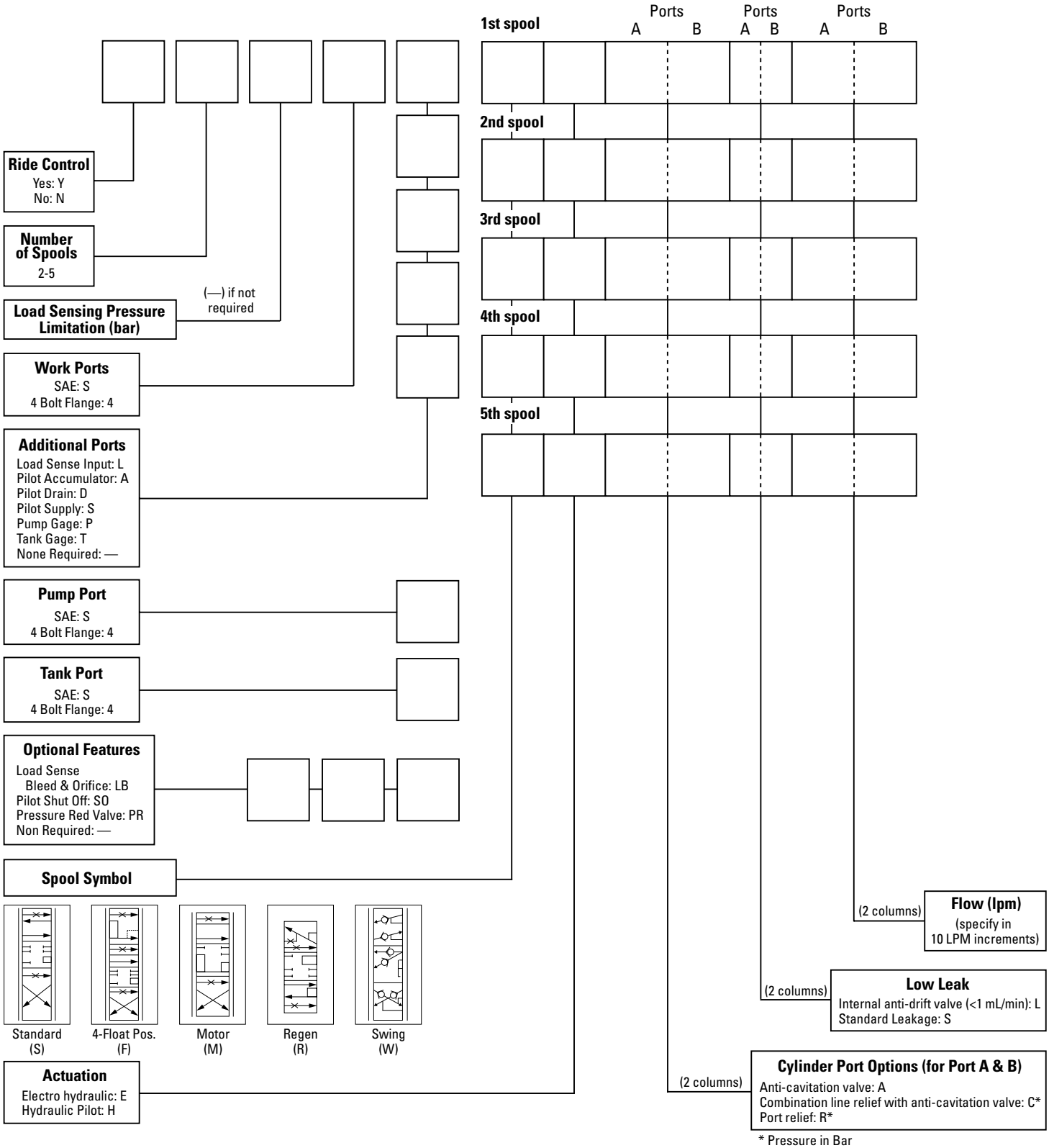
- A C3PC valve with 5-sections.
- A load sense relief set to 238 bar.
- SAE #10 work ports as well as additional ports for a pump gage, load sense input, and pilot supply.
- He selects a pressure reducing valve to protect the solenoids because the machine's pump pressure is over 35 bar. He also selects a pilot shut off valve to stop pilot flow if the electrical signal is lost.
- Each section will have a standard spool configuration and standard leakage requirements except for one, which will need a float spool and an anti-drift valve for low leakage in one port.
- Each section needs to be electro-hydraulically actuated.
- He the selects the cylinder port options and the respective max flows for the rod end and head end side of each section.



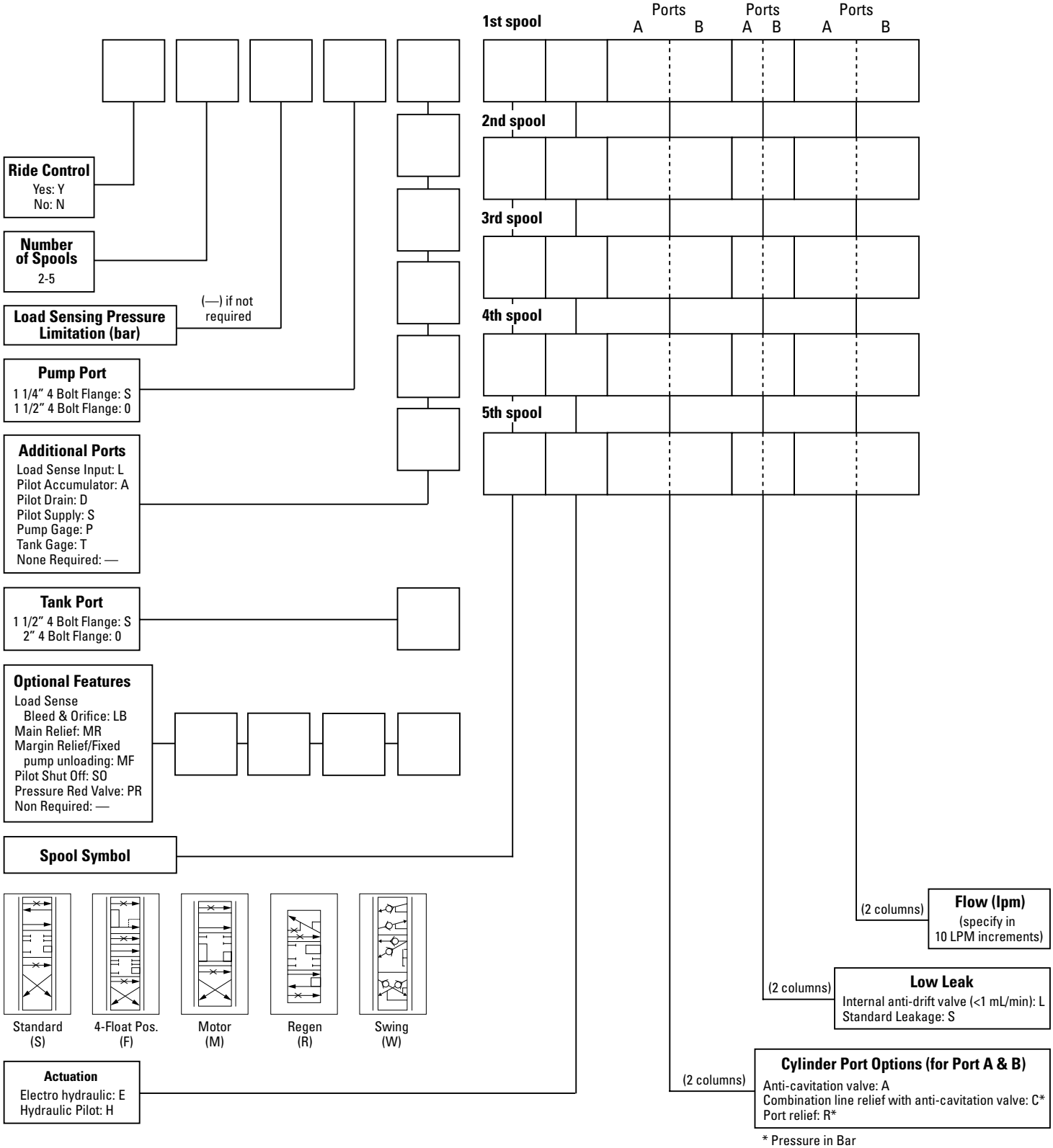
C3PC ordering detail



S3PC ordering detail



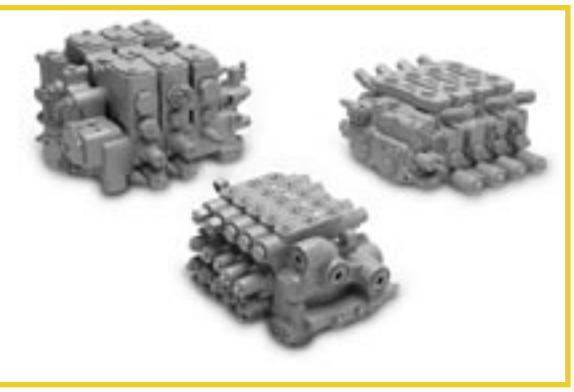
M3PC ordering detail



* Pressure in Bar

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